

S/853/62/000/000/006/008  
A006/A101

Specific features in thermal fatigue tests of...

ance. Four types of specimens are proposed. Bi-axial thermal stresses, attaining maximum values on the surface are characteristic for flat specimens; cylindrical-shaped samples are characterized by volumetric thermal stresses, whose longitudinal components are highest on the surface and axis; plane thermal stresses with maximum values of the longitudinal components in the thin ribs, are characteristic for triangular and trough-shaped specimens. Heating should be performed as if under operational conditions; the cooling rate should range between 50 to 400 degree/sec; cooling by a compressed air jet is recommended. A criterion for a general quantitative evaluation of thermal fatigue does not exist. Criteria used are thermal fatigue curves, which relate the number of cycles until the breakdown to the magnitude of the temperature drop, total (elastic and plastic) deformation, accumulated deformation, or to reference stresses, calculated from deformation values. Test results should be analyzed by methods of mathematical statistics. Method I is recommended for studying the nature of thermal fatigue and to determine a quantitative relationship between the parameters determining thermal fatigue resistance. Method II is recommended for determining thermal fatigue. There are 5 figures.

Card 2/2

YAKOVLEV, Yu.A.

Always on the go. Geog. v shkole 26 no.2:58-59 Mr-Apr '63.  
(MIRA 16:4)

(Geography—Study and teaching)

YAKOVLEV, Yu.A.

Always on the go. Geog. v shkole 26 no.2:58-59 Mr-Apr '63.  
(MIRA 16:4)

(Geography—Study and teaching)

KUL'BA, F.Ya.; YAKOVLEV, Yu.B.; MIRONOV, V.Ye.

Potentiometric study of nitrate and acetate complexes of thallium  
(III). Zhur. neorg. khim. 10 no.7:1624-1631 J1 '65.  
(MIRA 18:8)

1. Kafedra obshchey khimii Leningradskogo tekhnologicheskogo  
instituta imeni Lensovetu.

REVINA, A.A.; ARIPDZHANOV, Sh.A.; BAKH, N.A.; Prinimali uchastiye:  
YAKOVLEV, Yu.B.; MITINA, N.I.

Electron paramagnetic resonance study of the formation of free  
radicals in the irradiation of palmitic acid and its derivatives.  
Dokl.AN SSSR 145 no.2:363-365 J1 '62. (MIRA 15:7)

1. Institut elektrokhimii AN SSSR. Predstavleno akademikom  
A.N.Frumkinym.  
(Palmitic acid) (Radiation) (Radicals (Chemistry))

MIRONOV, V.Ye.; KUL'BA, F.Ya.; YAKOVLEV, Yu.B.

Diffusion potentials. Zhur. neorg. khim. 9 no.3:718-723  
Mr '64. (MIRA 17:3)

KUL'BA, F. Ya.; YAKOVLEV, Yu.B.; MIRONOV, V. Ye.

Hydrolysis of trivalent thallium salts. Zhur. neorg. khim. 9  
no.11:2573-2577 N '64 (MIRA 18:1)

KUL'BA, F.Ya.; MIRONOV, V.Ye.; MAVRIN, I.F.; YAKOVLEV, Yu.B.

Thermodynamics of the formation of univalent thallium associates.  
Zhur. neorg. khim. 10 no.9:2053-2056 S '65. (MIRA 18:10)

1. Leningradskiy tekhnologicheskii institut imeni Lensovet, kafedra  
obshchei khimii.



YAKOVLEV, Yu.I.; ZAYDEL'SON, M.I.

Estimation of prospects for finding gas in Permian sediments  
based on the hydrogeological characteristics of Kuybyshev  
and Orenburg Provinces. Trudy VNIIGAZ no.15:176-192 '62.  
(MIRA 15:8)

(Kuybyshev Province—Gas, Natural—Geology)  
(Orenburg Province—Gas, Natural—Geology)

YAKOVLEV, Yu.I.

Hydrogeological conditions in the Bashkatovskoye underground  
gas storage. Trudy VNIIGAZ no.15:193-198 '62. (MIRA 15:8)  
(Buguruslan region--Gas, Natural--Storage)  
(Buguruslan region--Water, Underground)

ZOR'KIN, L.M.; STADNIK, Ye.V.; YAKOVLEV, Yu.I.

Gas saturation of the reservoir waters of the sediments of the Middle Carboniferous of the southeast of the Russian Platform in connection with an evaluation of the prospects for finding oil and gas. Neftegaz. geol. i geofiz. no.9:41-44 '64.

(MIRA 17:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodnogo gaza.

SAVCHENKO, V.P.; VINOGRADOV, V.L.; YAKOVLEV, Yu. I.

Front and rear effect and its prospecting importance. Geol.  
nefti. i gaza 9 no.7:36-40 Je '65.

(MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodnogo  
gaza.

ZOR'KIN, L.M.; PETSUKHA, Yu.A.; STADNIK, Ye.V.; YAKOVLEV, Yu.I.

Gas saturation in the formation waters of the Lower  
Carboniferous and Upper Devonian carbonate sediments in the  
southeastern part of the Russian Platform. Trudy VNIIGAZ  
no. 25:88-94 '65. (MIRA 18:12)

FEYGIN, Leonid Aleksandrovich, YAKOVLEV, Yuriy Mikhaylovich: MBR, I.I.,  
redaktor; AVHUSHENKO, P.A., redaktor izdatel'stva; KONYASHINA, A.D.,  
tekhnicheskiy redaktor

[Machines and equipment for the construction and operation of city  
streets] Mashiny i oborudovanie dlia stroitel'stva i ekspluatatsii  
gorodskikh putei soobshcheniya. Moskva, Izd-vo Ministerstva kom-  
munal'nogo khoziaistva RSFSR, 1956. 369 p. (MIRA 10:1)  
(Road machinery)

~~YAKOVLEV, Yu.M.~~  
ALEKSANDROV, Ye.A., inzhener; YAKOVLEV, Yu.M., inzhener.

Conveyer system in finishing operations. Der.prom. 6 no.6:18-19  
Je '57. (MLRA 10:8)

1. Novgorodskaya mebel'naya fabrika.  
(Conveying machinery)  
(Wood finishing)

FEYGIN, L.A.; YAKOVLEV, Yu.M.; YERETSIIY, M.I.; VISHNEPOL'SKIY, A.M.;  
STANKOVSKIY, A.P., dotsent, nauchnyy red.; KROMOSHCH, I.L.,  
red.izd-va; RUDAKOVA, N.I., tekhn.red.

[Using building machinery and equipment] Eksploatatsia  
stroitel'nykh mashin i oborudovaniia. Moskva, Gos.izd-vo lit-ry  
po stroitel'stvu, arkhitekt. i stroit.materialam, 1960. 257 p.  
(MIRA 14:4)

(Building machinery)



IVANOV, N.N., prof.; OSADCHAYA, L.N., aspirant; YAKOVLEV, Yu.M., aspirant

New method for a rapid evaluation of the strength of nonrigid  
pavements. Avt.dor. 24 no.4:23-25 Ap '61. (MIRA 14:5)  
(Pavements---Testing)

IVANOV, N.N., prof., doktor tekhn.nauk; BARZDO, V.I., dotsent;  
YAKOVLEV, Yu.M., aspirant; OSADCHAYA, L.M., inzh.  
KOVRIZHNYKH, L.P., red.; DONSKAYA, G.D., tekhn.red.

[New methods of designing and testing flexible road pavements]  
Novye metody rascheta i ispytaniia dorozhnykh odezhd nezhestkogo  
tipa. Pod obshchei red. N.N.Ivanova. Moskva, Avtotransizdat,  
1962. 37 p. (MIRA 15:4)

1. Moscow. Avtomobil'no-dorozhnyi institut. 2. Zaveduyushchiy  
kafedroy stroitel'stva i ekspluatatsii dorog Moskovskogo avto-  
mobil'no-dorozhnogo instituta (for Ivanov).  
(Pavements)

20975

S/058/61/000/004/022/042  
A001/A101

24,7900 (1055,1137,1147,1158)

AUTHOR: Yakovlev, Yu.M.

TITLE: The measurement of parameters of ferrite ferromagnetic resonance

PERIODICAL: Referativnyy zhurnal. Fizika, no 4, 1961, 333, abstract 4E569 ("Izv Leningr. elektrotekhn. in-ta", 1960, no 43, 163 - 173)

TEXT: The author describes the results of an investigation of the resonance curve width  $\Delta H$  for spherical specimens of ferrites, placed in a reentrant resonator, at a frequency of 2,869 Mc. In measurements, the method of determining  $\Delta H$  is used which is based on reflection coefficient  $\Gamma$  of the reflecting resonator at the points where  $\chi''$ , imaginary component of the external tensor of high-frequency magnetic susceptibility  $\chi = \chi' - i\chi''$ , has the value  $\frac{1}{2}\chi\chi''_{res}$  (?); this method was extended to the case of reentrant resonator. The author presents formulae of relations between  $\Gamma$  and transmission coefficient  $T$  of the reentrant resonator on the one side and parameters of the ferrite specimen on the other side. He shows that the present method enables one to determine, fast and simple, the  $\Delta H$  width from the  $T(H)$  curve at points where  $\chi''$  has the value  $\frac{1}{2}\chi''_{res}$  as well

Card 1/2

20975

The measurement of parameters of ferrite ferromagnetic.. S/058/61/000/004/022/042  
A001/A101

as to determine the magnitude of  $\chi''_{res}$ . The measurements were performed on ferrite spheres whose diameter varied from 1.32 to 3.07 mm. It was established that  $\Delta H$  is independent, within the measurement errors, of diameter of the given specimens. It was determined that  $\Delta H = 59$  oe for Mg-Cr-ferrite and  $\Delta H = 30$  oe for yttrium garnet ferrite.

N. Smol'kov

[Abstracter's note: Complete translation.]

Card 2/2

24,7900  
S/058/62/000/010/075/093  
A061/A101

AUTHOR: Yakovlev, Yu. M.

TITLE: The internal tensor of the magnetic susceptibility of a magneto-anisotropic ferromagnetic ellipsoid

PERIODICAL: Referativnyy zhurnal, Fizika, no. 10, 1962, 48, abstract 10E375 ("Izv. Leningr. elektrotekhn. in-ta", 1961, no. 46, 179 - 183)

TEXT: A formula, presented in the general form, correlates the components of the internal tensor of the magnetic susceptibility of a ferromagnetic ellipsoid with the components of the external tensor of the magnetic susceptibility and the components of the tensor of the demagnetizing factor. Specific expressions are given for the components of an ellipsoid magnetized along one of the major axes. In the author's opinion, the relations obtained can be used to calculate the parameters of ferromagnetic semiconductor single crystals.

[Abstracter's note: Complete translation]

N. S.

Card 1/1

24.7900 (1055, 1144, 1163)

34231  
S/181/62/004/002/017/051  
B102/B138

AUTHOR: Yakovlev, Yu. M.

TITLE: Spin wave excitation by local surface magnetic irregularities.

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 407-412

TEXT: Magnetic relaxation and the role of spin waves was studied in ferromagnetic resonance, when spin waves were excited on local centers. Magnetic irregularities were artificially created on the surface of spherical yttrium garnet specimens 0.4 mm in diameter, which were successively polished with abrasives from 70 down to 5 and 3 $\mu$ . Measurements were carried out at 9070 Mc/s in a TE<sub>103</sub>(TYe<sub>103</sub>) reflecting square resonator with Q = 620. The variation in ferromagnetic resonance line width was investigated with the garnet spheres rotating. The maximum variation in line width was 15%. With specimens polished with 3 $\mu$  emery cloth maximum line width was in the [111] direction, minimum at [100] and medium values at [110]. Three peaks were observed between 0 and 90°, at 57°, 39° and 15°. The 57° maximum was analyzed. From the Card 1/8

Spin wave excitation by local surface ...

S/181/62/004/002/017/051  
B102/B138

resulting graph (Fig. 2) it can be seen that the peaks are shift with a change in abrasive grain size: From 40 to 20 to 10 $\mu$  the peak shifts from 59 to 57 to 54.5°. The condition for wave degeneracy reads

$$\frac{\omega_k}{\omega_0} = 1, \text{ with}$$

$$\frac{\omega_k}{\omega_0} = [(1 - N_z p + q k^2 p)(1 - N_z p + q k^2 p + 4\pi p \sin^2 \theta_k)]^{1/2}, \quad (2);$$

$p = M_0/H_0$ ,  $\omega_0 = \gamma H_0$ ,  $M_0$  - saturation magnetization for a given temperature,  $H_0$  - resonance field,  $N_z$  - demagnetizing factor in the direction of the constant magnetic field,  $q$  - exchange interaction parameter.  $q$  is related to the interaction parameter  $D$  known from literature (J. Appl. Phys. 32, 167, 1961) by  $D = \gamma^2 q$ . When the degeneracy condition is satisfied the frequency of uniform precession of a sphere with  $\kappa \rightarrow 0$  corresponds to the angle

Card 2/2

34234

Spin wave excitation by local surface ...

S/181/62/004/002/017/051  
B102/B138

$$\theta_0 = \arcsin \sqrt{\frac{1-(1-N_z p)^2}{4\pi p(1-N_z p)}}; \text{ for } M_0 = 139 \text{ gauss, } H_0 = 3290 \text{ oe and } N_z = 4\pi/7.$$

$\theta_0 = 59^\circ 20'$ . It was confirmed theoretically that the line broadening observed was due to degeneracy of uniform and spin wave precession. The spin wave propagation rate was calculated for  $k = 6.28 \cdot 10^{-3}$ :

$v_s = 2\pi \frac{f_0}{k} = 9.07 \cdot 10^6 \text{ cm/sec.}$  The spin wave travels  $\sim 10^{-2} \text{ cm}$  within a relaxation time of  $\tau_k = 10^{-9}$ . There are 4 figures and 6 references:

3 Soviet and 3 non-Soviet. The four most recent references to English-language publications read as follows: P. E. Seiden. J. Phys. Chem. Solids, 17, 259, 1961; R. C. Le Craw et al. Phys. Rev. 110, 1311, 1958; R. C. Le Craw, L. R. Walker. J. Appl. Phys. 32, 167S, 1961; M. Sparcs et al. Phys. Rev. 122, 791, 1961. ✓

Card 3/84



Spin wave excitation by local surface ... <sup>34234</sup>  
S/181/62/004/002/017/051  
B102/B138

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im.  
Ul'yanova (Lenina) (Leningrad Electrotechnical Institute  
imeni V. I. Ul'yanov (Lenin)) ✓

SUBMITTED: August 18, 1961

Fig. 2. Ferromagnetic line width in dependence on specimen orientation.  
(1) "natural" line anisotropy, (2), (3), (4), (5) - anisotropy  
when specimens were treated with 5, 20, 40 and 10 $\mu$  abrasives,  
respectively.

Card 4/84

S/181/62/004/007/002/037  
B102/B104

AUTHORS: Lebed', B. M., and Yakovlev, Yu. M.

TITLE: Study of the temperature and frequency dependences of the resonance curve width in polycrystalline ferrites

PERIODICAL: Fizika tverdogo tela, v. 4, no. 7, 1962, 1695 - 1700

TEXT: The width  $\Delta H$  of the resonance curves was measured as a function of  $t$  ( $^{\circ}\text{C}$ ) and  $f$  (Mc) on spheres of two polycrystalline ferrites:  $0.45 \text{ MgO} \times 0.76 \text{ Fe}_2\text{O}_3 \cdot 0.38 \text{ Cr}_2\text{O}_3 \cdot 0.12 \text{ CuO}$  and  $3 \text{ Y}_2\text{O}_3 \cdot 4.65 \text{ Fe}_2\text{O}_3 \cdot 0.35 \text{ Al}_2\text{O}_3$ . The measurements were made in the range from  $-190$  to  $+300^{\circ}\text{C}$  at 500, 647, 1001, 1496, 2590 and 9253 Mc/sec. The diameter of the sample was 4mm for 500 Mc/sec, but was smaller for the higher frequencies. The measurement curves ( $\Delta H(t)$ ,  $\Delta H(f)$ ,  $\delta(t)$ ;  $\sigma$ -magnetization) show that  $\Delta H(t)$  in polycrystalline samples is similar to that in single crystals. At low frequencies the low-temperature broadening of the resonance curve has another cause than at high frequencies: in the former it is due to temperature dependence of the relaxation frequency, as well as to magnetization, and the effect of domain structure, Card 1/2

Study of the temperature ...

S/181/62/004/007/002/037  
B102/B104

whereas in the latter it is an effect of impurities, and principally an effect of the maximum which they cause at low temperatures. The broadening of the resonance curve near the Curie point is due to the temperature fluctuations in the intensity of magnetization. Unlike in single crystals of  $3Y_2O_3 \cdot 5Fe_2O_3$ , the  $\Delta H$  here depends notably on the frequency, probably because of magnetic inhomogeneity. There are 4 figures.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I. Ul'yanova (Lenina) (Leningrad Electrotechnical Institute imeni V. I. Ul'yanov (Lenin))

SUBMITTED: December 28, 1961

Card 2/2

YAKOVLEV, Yu.M.

Anisotropy of the spin wave spectrum in yttrium garnet single crystals. Fiz.tver.tela 4 no.12:3626-3633 D '62. (MIRA 15:12)

1. Leningradskiy elektrotekhnicheskii institut im. V.I.Ul'yanova (Lenina).

(Yttrium) (Ferromagnetic resonance) (Nuclear spin)

YAKOVLEV, Yu. M., aspirant

Internal magnetic susceptibility tensor of a magneto-anisotropic  
ferromagnetic ellipsoid. Izv. LETI 59 no.46:179-183 '62.  
(MIRA 15:10)

(Magnetic materials) (Cores(Electricity))  
(Magnetic circuits)

S/181/62/004/012/042/052  
B125/B102

AUTHORS: Yakovlev, Yu. M., and Lebed', B. M.

TITLE: The temperature and frequency dependences of the ferromagnetic resonance line width of ferrite monocrystals with garnet and spinel structures

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3654-3662

TEXT: A report is given on experimental investigation of the temperature dependence (between room temperature and the Curie point) and frequency dependence (at the 4 fixed frequencies 1000, 1496, 2590 and 9200 Mc) of the ferromagnetic resonance line width of spherical ferrite monocrystals having garnet structure. Polycrystalline specimens of this type were already investigated by B. M. Lebed', Yu. M. Yakovlev (FTT, 4, 1695, 1962). It is pointed out that their values for the frequency dependence of the line width of ferrites are inconsistent with those obtained by R. C. Le Crow et al (Phys. Rev., 110, 1311, 1958) and by J. F. Dillon (Phys. Rev., 105, 759, 1957). The monocrystals of the ferrite  $\text{Mg}_{0.52}\text{Mn}_{0.87}\text{Fe}_{1.74}\text{O}_4$  were grown by the Verneuil method. The yttrium iron  
Card 1/3

The temperature and frequency ...

S/181/62/004/012/042/052  
B125/B102

garnets were obtained from a PbO melt at a cooling rate of  $2^{\circ}$ /hour. The measuring methods are described in the previous work first cited. The temperature dependence of the line width  $\Delta H$  has the same character at all frequencies. The line width of all specimens increases strongly in the vicinity of the Curie point. The characteristic temperature at which the line width of the iron yttrium garnets changes discontinuously is determined by the passage through the frequency  $\omega_0/2$  of the lower limit of the spin-wave spectrum. Using a monocrystalline disk made from yttrium iron garnet, the measurements of the temperature dependence of  $\Delta H$  were checked and found to be correct. This discontinuous change in the line width is due to a nonlinear three-magnon process with a low threshold field  $h_{thr} \sim 2$  millioersteds. The line width of optically polished yttrium iron garnets is, in practice, independent of the frequency. The line width  $\Delta H$  of such garnets as have a rough surface depends weakly on the frequency. As the frequency increases from 1000 to 9200 Mc,  $\Delta H$  increases by almost 100%, which cannot be explained by relaxation processes due to microscopic magnetic inhomogeneities. Owing to the discrepancies between the theory developed by A. M. Clogston et al. and the experimental data.

Card 2/3

The temperature and frequency ...

S/181/62/004/012/042/052  
B125/B102

obtained (Journ. Appl. Phys., 29, 429, 1958) it has so far not been possible adequately to describe the magnetic relaxation processes. The dissipative term in the equation of motion for ferromagnetic materials reads either  $\lambda [\vec{M} \times (\vec{M} \times \vec{H})/M^2]$  (Landau-Lifshits) or  $\omega_r [\lambda_0 \vec{H} - \vec{M}]$ . The losses are characterized by the parameters  $\lambda$  or  $\omega_r$ .  $\tau = 1/\omega_r$  is the relaxation time. There are 6 figures. ✓

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I. Ul'yanova-Lenina (Leningrad Electrotechnical Institute imeni V. I. Ul'yanov-Lenin)

SUBMITTED: May 19, 1962 (initially)  
July 18, 1962 (after revision)

Card 3/3



YAKOVLEV, Ye. N.

Effect of resonance absorption of spatially inhomogeneous electromagnetic radiation in ferromagnetics. Fiz. tver. tela 4 no.6: 1589-1596 Je '62. (MIRA 16:5)

1. Institut fiziki vysokikh davleniy AN SSSR, Moskva.  
(Electromagnetic waves) (Ferromagnetic resonance)

LEBED', B.M.; YAKOVLEV, Yu.M.

Temperature and frequency dependence of the resonance curve  
width in polycrystalline ferrates. Fiz.tver.tela 4 no.7:1695-  
1700 JI '62. (MIRA 16:6)

1. Leningradskiy elektrotekhnicheskiy institut imeni V.I.  
Ul'yanova (Lenina).  
(Ferromagnetic resonance) (Ferrates)

ACCESSION NR: AP4010251

S/0138/63/000/012/0005/0010

AUTHORS: Miylen, D. A.; Selivanovskiy, S. A.; Fernor, N. A.; Khazanovich, I. G.; Yakovlev, Yu. M.

TITLE: Continuous polymerization of monomers in the synthesis of latexes

SOURCE: Kauchuk i rezina, no. 12, 1963, 5-10

TOPIC TAGS: polymerization, monomer polymerization, polymerization product dispersion, latex, batch process, continuous process, emulsion polymerization, reactor, productivity, particle size, surface tension, surface film saturation

ABSTRACT: The accumulated experience of VNIISK in the production of synthetic latexes by continuous process is compared with the batch process. Latexes SKS-65GP, SKS-50PG, SKN-10P and SK-30ShKhP were synthesized by both procedures for 15 weeks. The particle size was determined by soap titration and by means of Tesla's electron microscope model BS-242, using as standard styrene latex with a particle size of 250 millimicrons. To counteract the flattening out of the particles and to increase the outline sharpness, the emulsions were stabilized with Leukanol and subjected to bromination. The surface tension in the latex-air interface and the degree of saturation of the globular membrane with the emulsifier were also deter-

Card 1/3

ACCESSION NR: AP4010251

mined. The average volume-surface diameter of the latex particles obtained by continuous polymerization was in all instances larger than those synthesized in batches. The surface tension in latexes produced continuously was smaller, the polydispersity of particles much higher, and the degree of saturation of the particle membranes with the emulsifier greater than in latexes produced in batches. It is expected that the enumerated colloidal changes in the latexes produced by the continuous process would affect their technical and technological properties. The productivity coefficient  $\eta$  for the apparatus used with a series of polymerizers can be computed from the A. N. Planovskiy formula

$$\eta = \frac{\int_{x_0}^{x_2} \frac{dx}{f(x)}}{\frac{x_1 - x_0}{f(x_1)} + \frac{x_2 - x_1}{f(x_2)} + \dots + \frac{x_k - x_{k-1}}{f(x_k)}}$$

where  $x$  is the amount of material used,  $f(x)$  is the velocity of reaction. Orig. art. has: 2 charts, 4 tables, and 1 equation.

Card 2/3

ACCESSION NR: AP4010251

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo  
kauchuka im. S. V. Lebedeva (All-Union Scientific Research Institute of Synthetic  
Rubber)

SUBMITTED: 00

DATE ACQ: 03Feb64

ENCL: 00

SUB CODE: CH

NO REF SOV: 007

OTHER: 005

Card 3/3

YAKOVLEV, Yu.M.

Macroscopic dynamic equation for ferromagnetic substances.  
Izv. AN SSSR. Ser. fiz. 27 no.12:1480-1482 D '63.

Spectrum of spin waves in magnetic-anisotropic cubic  
crystals. Ibid.:1483-1486 (MIRA 17:1)

L 12933-65 EWT(1)/SPA(s)-2/EWT(m)/ENP(1)/ENP(1) Pt-10 IJP(c) JD/JG/  
GG AS(mp)-2/AFWL/ASD(a)-5/RAEM(a)/ESD(as)/ESD(t)  
ACCESSION NR: AP4046603 S/0181/64/006/010/2953/2957

AUTHORS: Yakovlev, Yu. M.; Lebed', B. M.

TITLE: Minimum width of ferromagnetic resonance line of yttrium  
garnet single crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 10, 1964, 2953-2957

TOPIC TAGS: yttrium iron garnet, single crystal, ferromagnetic resonance, line width, relaxation process

ABSTRACT: This is a continuation of earlier investigations by the authors (FTT v. 4, 7, 654 and 1695, 1962), except that the measurements were made under conditions in which the non-intrinsic relaxation has been reduced to a minimum. The temperature dependence of the line width of ferromagnetic resonance of spherical samples of single crystal yttrium garnet was investigated in the linear region of the variable-magnetization amplitude at six fixed frequencies

Card 1/3

L 12933-65

0

ACCESSION NR: AP4046603

(500, 640, 1000, 1500, 2590, and 9200 Mcs) in the temperature interval 200--300C. The test procedure for measuring the temperature and frequency dependences of the line width was described by the authors in detail elsewhere (PTE No. 6, 107, 1962). The  $Y_3Fe_5O_{12}$  single crystals from which the investigated specimens were grown by crystallization from a molten PbO solvent under cooling at a rate of approximately  $1^\circ$  per hour. The method of preparing the samples from the single crystals was described by I. Ye. Gubler (PTE No. 5, 145, 1960). The results show that the rate of the fluctuation mechanism of relaxation depends on the frequency. Two relaxation mechanisms seem to be in operation. 1. A fluctuation mechanism, which causes the line width to increase at high temperatures. 2. A mechanism which leads to an increase in the line width of low temperatures. At each frequency, the temperature dependence was such that the line width increased at low and at high temperatures, with a fairly flat minimum in an intermediate region. It is shown that both relaxation mechanisms are inherent in an ideal ferromagnet.

Card 2/3



L 12933-65

ACCESSION NR: AP4046603

2

"The authors thank A. G. Gurevich for a useful discussion of the work." Orig. art. has: 4 figures and 6 formulas.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I. Ul'yanova (Lenina) (Leningrad Electrotechnical Institute)

SUBMITTED: 14Mar64

ENCL: 00

SUB CODE: SS, EM

NR REF SOV: 007

OTHER: 001

Card 3/3

L 12934-65 EWT(1)/EPA(s)-2/EWT(m)/EWP(b) Pt-10 IJP(c) JD/JG/GG  
 ASD(a)-5/AS(mp)-2/AFWL/RAEM(a)/ESD(gg)  
 ACCESSION NR: AP4046604 S/0181/64/006/010/2958/2962

AUTHORS: Lebed', B. M.; Yakovlev, Yu. M.

8

TITLE: Ferromagnetic relaxation in polycrystalline yttrium iron  
 garnet near the upper end point of the spin wave spectrum 27 27  
 21

SOURCE: Fizika tverdogo tela, v. 6, no. 10, 1964, 2958-2962

TOPIC TAGS: yttrium iron garnet, polycrystal, spin wave, ferromag-  
 netic resonance, line width, line broadening

ABSTRACT: To clarify some of the doubtful assumptions made in  
 earlier deductions by various authors that the maxima of the ferro-  
 magnetic resonance line broadening are in accord with the spin-wave  
 theory, the authors measured the temperature dependence of the line  
 width of polycrystalline and single-crystal samples of yttrium iron  
 garnet  $Y_3Fe_5O_{12}$  and single crystal nickel ferrite  $NiFe_2O_4$ . The mea-  
 surements were made at frequencies 1000, 1496, 2590, and 2950 Mcs

Card 1/3

L 12934-65

ACCESSION NR: AP4046604

using a method described by the authors earlier (PTE No. 6, 107, 1956). A maximum was observed on the temperature dependence of the line width at 2590 and 2950 Mcs at a temperature corresponding to magnetization at which the frequency of the homogeneous precession is contained in the spin-wave band. No maximum was observed at 1000 and 1496 Mcs. The ratio of the homogeneous precession frequency to the magnetization frequency was constant for both frequencies. The observed intensity of the line-width peaks at 2950 and 2590 Mcs, and the absence of peaks at 1496 and 1000 Mcs, is in accord with the theory of line broadening in polycrystalline ferrites, proposed by Schlomann (Phys. Chem. Solids v. 6, 242, 1958). It is shown that if the homogeneous precession frequency lies within the spin-wave spectrum, the magnitude of the line broadening does not agree with the Schlomann theory. Possible causes for this discrepancy are discussed. "In conclusion the authors thank A. G. Gurevich for valuable advice and a useful discussion of the present work." Orig. art. has: 4 formulas and 2 figures.

Card 2/3

L 12934-65  
ACCESSION NR: AP4046604

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I.  
Ul'yanova (Lenina) (Leningrad Electrotechnical Institute)

SUBMITTED: 14Mar64

ENCL: 00

SUB CODE: SS, EM

NR REF SOV: 002

OTHER: 004

Card 3/3

ACC NR: AP6037005 (A, N) SOURCE CODE: UR/0181/66/008/011/3407/3410

AUTHOR: Yakovlev, Yu. M.; Burdin, Yu. N.

ORG: none

TITLE: Angular dependence of the frequency of ferromagnetic resonance in an arbitrarily oriented plane of a cubic crystal

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3407-3410

TOPIC TAGS: ferromagnetic resonance, cubic crystal, magnetization, magnetic anisotropy, crystal orientation

ABSTRACT: In view of the fact that previously derived formulas for the resonant frequencies, with allowance for the crystallographic anisotropy, were confined to particular directions of the magnetic field, the authors derive present more general formulas that apply to a number of different particular cases. A general formula is derived for the angular dependence of the resonant frequency for the case when the constant magnetic field lies in a plane arbitrarily oriented relative to the crystallographic axis of a cubic lattice. The calculation method is the same as that described by A. G. Gurevich (Ferrity na sverkhvysokikh chastotakh [Ferrites at Microwave Frequencies] Fizmatgiz, 1960) or by I. R. McDonald (Proc. Phys. Soc., v. A64, 968, 1951). The problem reduces to the determination of the tensor of the demagnetizing factors of the crystallographic anisotropy. Several particular cases (weak magneti-

Card 1/2

ACC NR: AP6037005

zation plane perpendicular to the diagonal of the cubic lattice) are considered. It is also shown that when the magnetization and the field vectors coincide (when the anisotropy field is much weaker than the main field), the (111) plane is an almost isotropic plane in a cubic crystal (0.01% anisotropy). Orig. art. has: 1 figure and 9 formulas.

SUB CODE: 20/ SUBM DATE: 29Jan66/ ORIG REF: 002/ OTH REF: 006

Card 2/2

MIYLEN, D.A.; SELIVANOVSKIY, S.A.; FERMOR, N.A.; KHAZANOVICH, I.G.;  
YAKOVLEV, Yu.M.

Continuous polymerization of monomers in latex synthesis.  
Kauch. i rez. 22 no.12:5-10 D '63. (MIRA 17:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo  
kauchuka imeni Lebedeva.

YAKOVLEV, Yu. N., Cand Tech Sci -- (diss) "Effect of <sup>the</sup> conditions  
of ~~the feed~~ <sup>the feed</sup> of metal to the casting molds <sup>upon</sup> ~~in~~ the formation of  
ingots of ~~metal~~ <sup>subble-free</sup> steel." Dnepropetrovsk, 1958. 13 pp  
Min of Higher Education UkrSSR. Dnepropetrovsk Order of Labor  
Red Banner Metallurgical Inst im I.V. Stalin. Chair of Metallurgy  
of Steel) (KL,38-59, 118)

57



SOV/137-58-12-24237

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 12 p 45 (USSR)

AUTHOR: Yakovlev, Yu. N.

TITLE: Formation of Surface Layers of an Ingot in Bottom Pouring Into Perforated Molds (Formirovaniye poverkhnostnykh sloyev slitka v protsesse napolneniya skvoznnykh izlozhnits sifonnym sposobom)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, Nr 3, pp 34-41

ABSTRACT: Hydraulic model simulation, with subsequent verification of the results obtained on Al and steel ingots is used to study distribution of liquid (L) flows within a mold (M) during bottom pouring and of the influence of these flows upon the formation of the external layers of an ingot. The experiments were run on models of big-end-down bottom-pouring M, made of organic glass, in 1:4 natural size with similar scaling of the conditions of delivery of L thereto. Water is used to simulate the metal. Measurement of the velocity head of the L is made at various levels of the model. The investigations are run at various rates of filling and at various filling levels. It is found that the axis of the submerged stream introduced into an M deviates

Card 1/2

SOV/137-58-12-24237

Formation of Surface Layers of an Ingot in Bottom Pouring Into Perforated (cont.)

from the vertical toward the wall opposite to the side from which the L is introduced and that all the stream parameters depend upon the height to which the M is filled. It is shown that the angle formed by the M axis and the boundary of the stream facing the wall opposite the side of L introduction grows with increase in filling rate and with rise in the L level in the M, while the angle between the opposite boundary of the stream and the M axis reduces with these changes in parameters. The maximum changes in these angles occur at a height equal to from 16 to 28 diameters of the runner bringing the L to the M. Observations have established the presence of downcurrents forming at the initial stage of filling, both at the M wall adjacent to the center wall and at the opposite wall. As the L level in the M rises, the first of these streams become stronger and the latter virtually disappear, becoming upcurrents. The angle of divergence of the stream is identical in all directions and comes to  $\sim 65-70^\circ$ . An investigation of rings cut out of hollow sleeves formed by draining the unsolidified ingot cores confirmed the existence and the nature of the flows described above. The interior surface of the rings cut from these steel sleeves revealed a graininess, which is particularly noticeable on the washed side of the skin. It is also found that longitudinal outside cracks in ingots form where the skin is thinnest. The tendency to longitudinal-crack formation rises with ingot height.

Card 2/2

I. G.

LAPITSKIY, V.I., doktor tekhn.nauk, prof.; STUPAR', N.I., dotsent;  
STUPEL', S.I., inzh.; TARAPAY, M.A., inzh.; TIMOFEYEV, V.L., inzh.;  
YAKOVLEV, Yu.N., inzh.

Certain problems in the preparation of steel ingots for wheels.  
Izv. vys. ucheb. zav.; chern.met. no.5:21-28 My '58. (MIRA 11:7)

1.Dnepropetrovskiy metallurgicheskiy institut i zavod im. K.  
Libknekhta.

(Steel ingots)

YEFIMOV, Viktor Alekseyevich; LAPITSKIY, V.I., prof., doktor tekhn.nauk, retsenzent; YAKOVLEV, Yu.N., kand.tekhn.nauk, retsenzent; DANILIN, V.I., retsenzent; DOBROKHOTOV, N.N., akademik, red.; GROMOV, N.D., red.izd-va; VAYNSHTEYN, Ye.B., tekhn.red.

[Steel ingots; casting and formation of the ingot] Stal'noi slitok; razlivka stali i formirovanie slitka. Pod red. N.N.Dobrokhotova. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 356 p. (MIRA 14:3)

1. AN USSR (for Dobrokhotov). 2. Nachal'nik TSentral'noy zavodskoy laboratorii zavoda "Krasnyy Oktyabr'" (for Danilin).  
(Steel ingots)

YAKOVLEV, Yu.N.

Geology, mineral composition, and genesis of the Kurzhunkul'skiy iron  
ore deposit. Zap. IGI 42 no.2. 38-64. '62. (MIRA 15:6)  
(Turgay Gates--Ore deposits)

YAKOVLEV, Yu.N.

Spherulitelike magnetite aggregates and tabular pyrite isolations in the Kurzkhunkul'skiy ore deposit. Zap. LGI 42 no.2:65-77 '62.

(MIRA 15:6)

(Turgay Gates--Magnetite) (Turgay Gates--Pyrites)

ISAYEV, Ye.I.; KUSHNAREV, I.T.; TARAPAY, M.A.; YAKOVLEV, Yu.N.;  
LAPITSKIY, V.I., prof., doktor tekhn.nauk, nauchnyy rukovo-  
ditel' raboty

Developing an efficient type of nozzle and stopper for the  
continuous casting of steel. Izv.vys.ucheb.zav.; chern.met.  
6 no.1:42-49 '63. (MIRA 16:2)

1. Dnepropetrovskiy metallurgicheskiy institut.  
(Continuous casting--Equipment and supplies)

PARIMONCHIK, I.B.; SOROKIN, A.A.; ZAGREBA, A.V.; YAKOVLEV, Yu.N.;  
PAVLOVTSEVA, N.I.; UL'YANOV, D.P.; FURS, I.I.

Studying metal flow in the top pouring of rail steel by  
high-speed motion picture photography. Stal' 24 no.5:  
414-417. My '64. (MIRA 17:12)



PARIMONCHIK, I.B., inzh.; SOROKIN, A.A., inzh.; KUTSENKO, A.D., inzh.;  
KARPUNIN, A.M., inzh.; PAVLOVTSEVA, N.I., kand. tekhn. nauk;  
KOBURNEYEV, I.M., inzh.; YAKOVLEV, Yu.N., kand. tekhn. nauk;  
TRUSEV, A.I., inzh.; ORGIYAN, V.S., inzh.

Improving the flow during metal pouring. Stal' 24 no.5:  
425-426 My '64. (MIRA 17:12)

YAKOVLEV, Yu.N., kand. tekhn. nauk; PANIOTOV, Yu.S.; ZHERNOVSKIY, V.S.;  
BELYAYEV, Yu.P.

Slag formation and smelting in 650 and 900-ton capacity  
open-hearth furnaces. Met. i gornorud. prom. no.6:24  
N-D '64. (MIRA 18:3)

YAKOVLEV, Yu.N., kand. tekhn. nauk; KUSHNAREV, I.T.; LAPITSKIY, V.I.,  
doktor tekhn. nauk, rukovoditel' raboty

Hot longitudinal cracks on flat, continuous ingots. Met. 1  
gornorud. prom. no.4:31-35 J1-Ag '64. (MIRA 18:7)

YAKOVLEV, YU. P.

Dissertation: "The Problem of an Investigation of Evaporation in a Two-Phase Flow."  
Cand Tech Sci, Kazan' Aviation Inst, Kazan', 1954. (Referativnyy Zhurnal--Fizika,  
Moscow, Aug 54)

SO: SUM 393, 28 Feb 1955

21(7)

AUTHORS: Ostroumov, V. I., Yakovlev, Yu. P.

SOV/56-35-6-6/44

TITLE: Multi-Charged Particles Emitted During the Nuclear Splitting of Carbon by Protons With Energies of 660 Mev (Mnogozaryadnyye chastitsy, ispuskayemye pri rasshcheplenii yader ugleroda protonami s energiyey 660 MeV)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 6, pp 1358-1363 (USSR)

ABSTRACT: O.V. Lozhkin, N.A. Perfilov (Ref 1), V.M. Sidorov, Ye.L. Grigor'yev (Ref 2) as well as Ostroumov, Perfilov and R.A. Filov (Ref 3) already worked in this field. The results they obtained are discussed in short in the introduction. The authors themselves investigated multi-charged particles emitted by carbon nuclei bombarded with 660 Mev protons. The target consisted of a 2C $\mu$  thick polystyrene film which was pasted on to the photoplate. The fragments emitted by the film were recorded in the emulsion layer (P-9). Proton irradiation was carried out on the synchrocyclotron of the OIYaI (United Institute for Nuclear Research). Exposure was in three orientations of the emulsion towards the main direction of the beam: a) parallel, b) vertical, and c) at an angle of 36°. The results obtained by the investigations are very clearly shown by

Card 1/3

OV/56-35-6-6/44

Multi-Charged Particles Emitted During the Nuclear Splitting of Carbon by  
Protons With Energies of 660 Mev

figures 1a and 1b:

Figure 1a shows the connection between the total structural thickness of the trace  $T$  and the particle range  $R$  at an angle of inclination towards the emulsion plane of up to  $30^\circ$ ; figure 1b shows the same for an angle between  $30$  and  $60^\circ$ . The curves (straights)

for  $\text{He}_2^4$ ,  $\text{Li}_3^8$ ,  $\text{B}_5^8$ , and  $\text{N}_7^{14}$  are within the ranges  $50 \angle T \angle 300$  and

$5 \angle R \angle 40\mu$ . Figure 2 shows the corresponding trace distribution according to  $T$ , and figure 3 shows the energy spectrum of the fragments with a range of  $>40\mu$ ; figure 4 shows the angular distribution of the fragments with respect to the proton beam compared with that calculated in reference 1. (The calculation method is discussed in an appendix to this paper). The authors further investigated the effective production cross section  $\sigma_{\text{frag}}$  for multi-charged particles

from C-nuclei. The proton flux was determined according to the number of stars formed in all plates on emulsion nuclei. The star production cross section is 1060 mb (Ref 6). For  $\sigma_{\text{frag}}$  the value

$1.4 \pm 0.5$  mb is given. This value holds for the emission of particles with a range of  $>20$  and a charge of  $>3$ . The effective

Card 2/3

SOV/56-35-6-6/44

Multi-Charged Particles Emitted During the Nuclear Splitting of Carbon by  
Protons With Energies of 660 Mev

cross section for the emission of a  $\text{Li}_3^8$ -nucleus with  $E > 10$  Mev is  
equal to  $(5 \pm 2) \cdot 10^{-29} \text{ cm}^2$ . The experimental data obtained agree  
well with those obtained by Lozhkin and Perfilov (Ref 1).  
In conclusion, the authors thank O.V. Lozhkin, Yu.I. Serebrennikov,  
and R.A. Filov for their help and discussions, and N.A. Perfilov  
for his interest in this work.- There are 5 figures and 9 references,  
6 of which are Soviet.

ASSOCIATION: Leningradskiy politekhnicheskii institut  
(Leningrad Polytechnic Institute)

SUBMITTED: June 16, 1958

Card 3/3

5.1170

68956

SOV/81-60-2-5281

Translation from: Referativnyy zhurnal. Khimiya, 1960, Nr 2, p 304 (USSR)

AUTHOR: Yakovlev, Yu.P.

TITLE: Investigation of the Evaporation of a Liquid in a Vertical Pipeline

PERIODICAL: Tr. Kazansk. aviats. in-ta, 1958, Vol 38, pp 219 - 238

ABSTRACT: The analysis of experimental data obtained in the process of evaporation in a two-phase flow leads to an equation which comprises all essential parameters:  $Gu_x/Gu_0 = 1.25 \cdot 10^{-3} Re^{0.52} (1/d)^{-0.75} G^{-0.2}$ , where  $Gu = (t_d - t_m)/t_d$  is Guchmann's criterion of the parametric type which is the relative potential of drying;  $Gu_0$  and  $Gu_x$  are the  $Gu$  values at the initial and at a given point of the two-phase flow;  $t_d$  and  $t_m$  the temperatures of the dry and the moist thermometers;  $G = G_l/G_a$ ;  $G_l$  and  $G_a$  are the weight consumptions of liquid and air. It has been noted that the equation describes well all experimental data obtained in the following range of parameter changes:  $t_d$  10 - 100° C;  $t_m$  1 - 90° C; relative humidity 0.01 - 1.0; flow velocity 0 - 100 m/sec;  $Re$   $23 \cdot 10^3$  -  $450 \cdot 10^3$ ;  $G$  0.02 - 0.1.

Card 1/1

A. Rovinskiy



ACCESSION NR: AP4009137

S/0056/63/045/006/2072/2073

AUTHORS: Bogatin, V. I.; Lozhkin, O. V.; Yakovlev, Yu. P.

TITLE: Formation of fast residual nuclei

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 45, no. 6, 1963, 2072-2073

TOPIC TAGS: residual nucleus, fast residual nucleus, fast residual nucleus formation, fast fragment formation, nuclear disintegration, fragmentation, direct nuclear interaction theory, lithium 8, beryllium 8, few nucleon reaction

ABSTRACT: To study the momentum distribution of the residual nuclei in the case of simple few-nucleon reactions of the type (p, 2p) or (p, pn), when high energy particles interact with light nuclei, and to ascertain the feasibility of a large momentum transfer in such reactions (this is necessary to explain fragmentization by heavy nuclei), experiments were made with the  $\text{Be}^9(p, 2p)\text{Li}^8$  reaction with 660 MeV protons, under conditions similar to those described by

Card 1/2

ACCESSION NR: AP4009137

the authors earlier (DAN SSSR v. 151, 826, 1963). The energy spectra determined from 1184  $\text{Li}^8$  tracks in emulsion indicate clearly that large momentum transfer (on the order of 1000 MeV/c) is possible in reactions where one nucleon breaks away from a light nucleus. "The authors are indebted to Prof. N. A. Perfilov for interest in the work and useful discussions, to Prof. V. P. Dzhelepov for support of the program on the fragmentation process, of which this investigation is a part, and to S. P. Tret'yakova and V. P. Perelygin for help with the processing of the nuclear emulsions." Orig. art. has: 1 figure and 1 table.

ASSOCIATION: None

SUBMITTED: 11Sep63

DATE ACQ: 02Feb64

ENCL: 00

SUB CODE: PH

NO REF SOV: 003

OTHER: 000

Card 2/2

L 17540-63

ENP(q)/EWT(m)/EDS AFFTC/ASD JD/JG

ACCESSION NR: AP3004420

S/0020/63/151/004/0826/0828

AUTHORS: Lozhkin, O. V.; Perfilov, N. A.; Yakovlev, Yu. P.

64  
58

TITLE: Singularities of the formation of  $\text{Li}^8$  sub 3 sup 8 during the reaction of 660 Mev protons with  $\text{C}^6$  sub 6 sup 12 nuclei. 27

SOURCE: AN SSSR, Doklady\*, v. 151, no. 4, 1963, 826-828

TOPIC TAGS:  $\text{Li}^8$  sub 3 sup 8,  $\text{Li}$ ,  $\text{C}$ ,  $\text{C}^6$  sub 6 sup 12, phasotron, polystyrene, polyethylene,  $\text{B}^8$  sub 5 sup 8

ABSTRACT: Authors studied the angular distribution of the fragments of  $\text{Li}^8$  and their energy spectra upon splitting of  $\text{C}_6^{12}$  nuclei. Thin films of polystyrene and polyethylene were irradiated in a vacuum chamber by a beam  $10^{13}$  protons per  $\text{cm}^2$  from the phasotron of the consolidated institute for nuclear studies. The proton energy was 660 Mev. The fragments were recorded photographically at angles of 20, 47, 90, and  $137^\circ$  relative to the proton beam. Practically all of the observed tracks belonged to  $\text{Li}^8$  nuclei. Absence of the  $\text{B}_5^8$  isobar is significant, because it indicates an asymmetry of the nuclear structure of  $\text{C}_6^{12}$  in relation to the mirror clusters of  $\text{B}_5^8$  and  $\text{Li}_3^8$ . Conclusions are drawn concerning the origin

Card 1/2

L 17540-63

ACCESSION NR: AP3004420

6  
of the soft part of the spectra, and other features of the observed distributions.  
"In conclusion, the authors express their deep gratitude to Prof. V. P. Dzhelepov  
for the support of this work, to R. G. Vasil'yev, V. N. Kuz'min, Ye. S. Rozhkov,  
and R. M. Yakovlev for the help with the experiments, and to P. A. Gorichev for  
the discussion of several problems touched upon in this paper". Orig. art. has:  
2 figures.

ASSOCIATION: none

SUBMITTED: 01Mar63

DATE ACQ: 21Aug63

ENCL: 00

SUB CODE: PH

NO REF SOV: 005

OTHER: 001

Card 2/2

ABDEYCHIKOV, V. V.; BOGATIN, V. I.; LOZHKIN, O. V.; PERFILOV, N. A.; YAKOVLEV, Yu. P.

"Concerning the Possibility of Investigation of Multi-Nucleon Clustering in the Periphery of Nuclei by Reactions with Fast Particles."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

Radium Inst.

KUZ'MIN, V. N.; YAKOVLEV, R. M.; YAKOVLEV, Yu. P.

"Investigations of  $\text{He}^4(p, nn, x\pi)\text{He}^3$  Reactions with 660 MeV Protons."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi,  
14-22 Feb 64.

Radium Inst.

LOZHKIN, O. V.; YAKOVLEV, Yu. P.

"Investigation of the Momentum Distribution of Protons in the p-shell of Be<sup>9</sup>."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

Radiyevyy Institut (Radium Inst)

ACCESSION NR: AP4019202

S/0056/64/046/002/0431/0434

AUTHORS: Bogatin, V. I.; Lozhkin, O. V.; Perfilov, N. A.; Yakovlev, Yu. P.

TITLE: Energy spectra and angular distribution of Li-8 fragments produced in interactions between 660-MeV protons and aluminum nuclei

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 431-434

TOPIC TAGS: lithium 8, lithium 8 fragment, intranuclear reaction mechanism, fragmentation, surface cluster formation, proton aluminum interaction, lithium fragment energy spectrum

ABSTRACT: This work is part of a study of the relation between quasielastic knockout of fragments and the various mechanisms of intranuclear reactions, in which the formation of each specific isotope will eventually be investigated in detail over a wide range of

Card

1/32



ACCESSION NR: AP4019202

incident-particle energies and target-nucleus masses. The products of the nuclear reactions between 660-MeV protons and aluminum nuclei were registered in nuclear emulsions at several angles and the emulsion tracks corresponding to the nuclei  $\text{Li}^8$ ,  $\text{Li}^9$ ,  $\text{Be}^8$ , and  $\text{B}^8$  were investigated. The observed similarity between the energy spectra of the resultant  $\text{Li}^8$  and those of carbon, and the absence of the  $\text{B}^8$  isobar in both cases, suggest that in both reactions the  $\text{Li}^8$  production is due to formation of nucleon clusters localized on the surface of the target nucleus. The correspondence observed between the calculated and experimental angular distribution of  $\text{Li}^8$  confirms this hypothesis and suggests that detailed information on the reactions accompanied by fragments on very light target nuclei will make it possible to identify and separate reactions on surface clusters. "In conclusion, the authors are grateful to Prof. V. P. Dzhelepov for support of this work and to R. G. Vasil'kov for help with the experiment. Orig. art. has: 3 figures.

Cord

2/3

AFANAS'YEVA, R.V.; LOZHKIN, O.V.; MAL'TSEV, V.M.; YAKOVLEV, Yu.P.

[Production of  $Li^8$  in the fission of  $Cl^{12}$  nuclei by high-energy protons] Obrazovanie  $Li^8$  v rasshchepleniakh iader  $Cl^{12}$  protonami vysokoi energii. Dubna, Ob"edinennyi in-t iadernykh issl., 1964. 8 p. (MIRA 17:5)

BOGATIN, V.I.; LOZHKIN, O.V.; YAKOVLEV, Yu.P.

Formation of fast residual nuclei. Zhur. eksp. i teor. fiz.  
45 no.6:2072-2073 D '63. (MIRA 17:2)

L 15376-65 EWT(m) DIAAP/SSD/AFWL/RAEM(c)/ESD(t)  
ACCESSION NR: AP4048630

S/0048/64/028/010/1573/1577 **B**

AUTHOR: Ivdeychikov, V.V.; Bogatin, V.I.; Lozhkin, O.V.; Perfilov, N.A.; Yakovlev, Yu.P.

TITLE: Many-nucleon clusters<sup>14</sup> in the peripheral nuclear region evinced in reactions with fast particles /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-22 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.10, 1964, 1573-1577

TOPIC TAGS: nuclear physics, nucleon clusters, carbon, aluminum, vanadium

ABSTRACT: The energy and angular distributions of  $\text{Li}^8$  nuclei ejected from  $\text{C}^{12}$ ,  $\text{Al}^{27}$  and  $\text{V}^{51}$  by 660 MeV protons were investigated. Three of the authors have described the experimental technique elsewhere (Doklady\* AN SSSR 151,826.1963). The energy distribution was found to depend on the angle of expulsion. At low angles all the spectra have high energy tails corresponding to momenta of the order of the total momentum of the incident proton. The energy distributions of  $\text{Li}^8$  from  $\text{C}^{12}$  at  $20^\circ$  and  $90^\circ$  are very similar to the corresponding distributions of residual  $\text{Li}^8$  nuclei from the disintegration of  $\text{Be}^9$  by high energy protons, and it is concluded

1/2

L 15376-65

ACCESSION NR: AP4048630

that the ejected  $\text{Li}^8$  nucleus is formed by direct reaction of the incident proton with a  $\text{Be}^9$  cluster within the  $\text{C}^{12}$  nucleus. The spectrum of  $\text{Li}^8$  from  $\text{Al}^{27}$  was calculated on the assumption that it is formed from a  $\text{Be}^9$  cluster and is subject to absorption by the residual nucleus. Good agreement with experiment was found. The spectrum of  $\text{Li}^8$  from  $\text{V}^{51}$  was calculated on the assumption that  $\text{Li}^8$  is formed only during the evaporation stage of the reaction. Fair agreement with experiment was obtained for large expulsion angles, but the observed yield at low angles was considerably greater than the calculated. It is concluded that direct reactions with clusters in the peripheral region make a significant contribution in this case also. Orig.art.has: 3 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: NP

NR. REF SOV: 008

OTHER: 000

2/2

BOGATIN, V.I.; LOZHKIN, O.V.; PERFILOV, N.A.; YAKOVLEV, Yu.P.

Energy spectra and angular distribution of  $Li^9$  fragments  
produced in the interaction between 660 Mev. protons and  
aluminum nuclei. Zhur. eksp. i teor. fiz. 46 no.2:431-434  
F. '64. (MIRA 17:9)

ACCESSION NR: AP4042360

S/0056/64/047/001/0007/0011

AUTHORS: Lozhkin, O. V.; Yakovlev, Yu. P.

TITLE: Features of production of fast residual nuclei in the reaction  $\text{Be}^9(p, 2N \times \pi)\text{Li}^8$

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 7-11

TOPIC TAGS: proton interaction, beryllium, lithium, momentum transfer, elastic scattering

ABSTRACT: The purpose of the investigation was to study the characteristics of the transfer of large momenta to residual nuclei, and to ascertain the extent to which the interaction between the incident and bound nucleons is quasi-free. The singularities in the production of fast residual nuclei in the reaction  $\text{Be}^9(p, 2N \times \pi)\text{Li}^8$  were investigated to this end. The reasons for choosing  $\text{Be}^9$  as a target nucleus and the experimental procedure are described. An analysis

Card 1/3

ACCESSION NR: AP4042360

of the results indicates that at least up to 750 MeV/c the large momentum transfer to the residual nuclei  $\text{Li}^8$  can be explained by assuming quasi-free interaction between the incident proton and the nucleon. In view of its importance, it is concluded that a review of this process is necessary with allowance for elastic scattering, which was neglected in the present analysis, and with an examination of the alternate possibility of transfer of large momentum to the  $\text{Li}^8$  nucleus by knock-on from the  $\text{Be}^9$  nucleus. "In conclusion the authors are deeply grateful to Professor N. A. Perfilov for interest in the work and for a discussion of problems connected with its performance, to Professor V. P. Dzhelepov for making it possible to carry out the experiment in the laboratory of nuclear problems OIYaI, V. M. Mal'tsev for valuable advice and discussions, S. N. Shumilov and Ye. S. Rozhkov for help in organization of the experiment and to V. P. Pereygin for collaboration in processing of the nuclear emulsions." Orig. art. has: 4 figures and 1 formula.

Card 2/3



AFANAS'YEVA, R.V.; LOZHKIN, O.V.; MAL'TSEV, V.M.; YAKOVLEV, Yu.P.

$\text{Li}^8$  production in the fissure of  $\text{C}^{12}$  nuclei by high-energy protons.  
Iad. fiz. 1 no.1:76-79 Ja '65. (MIRA 18:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.

YAKOVLEV, Yu. Ia. inzh., YOGOSHIN, V.V.

A blasting method for roof caving in the mining of thick seams  
by a combined system. Ugol' 40 no.8:33-34 Ag '65.

(MIRA 18:8)

1. VzyvPEU kombinata Kuzbassugol' (for Yakovlev). 2. Treat  
Kiselevskugol' (for Yegoshin).

18.4000 2508

S/128/60/000/007/004/017  
A105/A033

AUTHORS: Balandin, G.F., Gini, E.Ch., Stepanov, Yu.A. and Yakovlev, Yu.P.

TITLE: Casting With a Vibration Pouring Device

PERIODICAL: Liteynoye proizvodstvo, 1960, No. 7, pp. 34-36

TEXT: The authors mention the effect of vibration on metal crystallization and describe tests performed with a vibration pouring device (Fig.1), designed by the members of the Institut metallurgii imeni A.A. ~~Baykov~~, AN SSSR (Institute of Metallurgy imeni A.A. Baykov of the AS USSR), G.F. Balandin and V.A. Petrunichev. Fig.2 shows macrosections of A2 aluminum ingots. The ingot shown in Fig.2a was poured with the aid of a non-vibrating device, ingot shown in Fig.2b through a vibrating funnel with a frequency of 230 oscillations/sec., an amplitude of 0.1 mm, power 1 kw, temperature of liquid aluminum 720°C, ingot weight 2 kg and pouring time 4 seconds. The ingot obtained with the vibration pouring device was finer grained and its plasticity increased by 20% (see Table). Tests showed that casting through a vibrating pouring device produces the same effect as pouring into vibrating molds. A  
Card 1/7

Casting With a Vibration Pouring Device

S/128/60/000/007/004/017  
A105/A033

considerable crushing of grains in the ingots indicates an increase of the crystallization centers in the liquid metal during vibration. Fig.3 shows specimens on which the tendency of aluminum alloys to hot cracks was tested. The specimen of AD1 aluminum (Fig.3a) was poured through a non-vibrating funnel; the one shown in Fig.3b was poured through a vibrating funnel at 720°C and showed no hot cracks. As the metal is poured through the vibrating funnel the walls become coated with a hard layer of metal. This layer is broken by the vibration of overheated liquid metal and solid metal pieces are carried into the mold together with liquid metal, where they melt partly or completely. If no complete melting is reached by the time the metal begins to solidify, these solid phases become centers of crystallization. Fig.4 shows a macrophotograph of the longitudinal section of the coating removed from the funnel walls after pouring of aluminum under vibration while Fig.5 shows the longitudinal section of an ingot completely solidified in a vibrating funnel. A distinct boundary can be observed between the acicular crystal zone and the central crushed grains zone. The grain size depends on the temperature of the metal during pouring. Higher temperatures ensure complete melting of the solid phase by the time crystallization of the metal begins. Higher resistance to hot cracks is attributed to an increase in plasticity

Card 2/7

Casting With a Vibration Pouring Device

S/128/60/000/007/004/017  
A105/A033

of fine-grained alloys. This method improves the mechanical properties of alloys and increases their resistance to hot cracks. It can be applied to every type of mold and to a great number of alloys without changing the vibrating conditions. A satisfactory vibration effect was obtained with AL-4, AL-2, "avial"-type alloys and 15L steel. There are 6 figures, 1 table and 13 references: 11 Soviet and 2 non-Soviet.

Card 3/7

Casting With a Vibration Pouring Device

S/128/60/000/007/004/017  
A105/A033

Table 1:

1) aluminum grade; 2) alloy;  
3) pouring temperature; 4) casting conditions; 5) cast; 6) after annealing; 7) cast; 8) rolled; 9) cast; 10) in chill molds without vibration; 11) in chill molds through a vibrating funnel; 12) in chill molds without vibration; 13) in chill molds through vibrating funnel; 14) in sand molds without vibration; 15) in sand molds through a vibrating funnel.

1) Марка алю- миния	2) Сплав	3) Темпе- ратура залив- ки в °C	4) Условия литья
АД1	7,7-7,9 8,2-8,5 8,5-8,8 8,5-8,7 7,84-7,14 7,7-8,02	25,0 26,0 29,5 30,0 21,3 26,5	5) Литье 6) После отжига 7) Литье 8) Катаный 9) Литье
А2	4,97-5,35 5,35-5,47	4,5 7,0	700 700 700 720 730 740 740
			10) В кокиль без вибрации То же 11) В кокиль через вибрирующую воронку 12) В кокиль без вибрации 13) В кокиль через вибрирующую воронку 14) В песчаную форму без вибрации 15) В песчаную форму через вибрирующую воронку

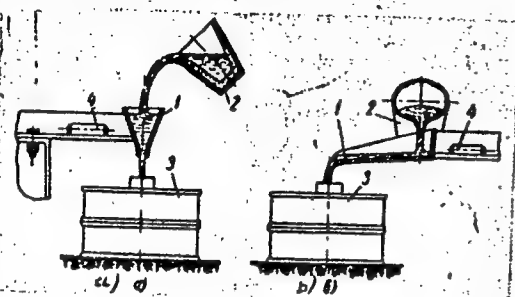
Card 4/7

# Casting With a Vibration Pouring Device

S/128/60/000/007/004/017  
A105/A033

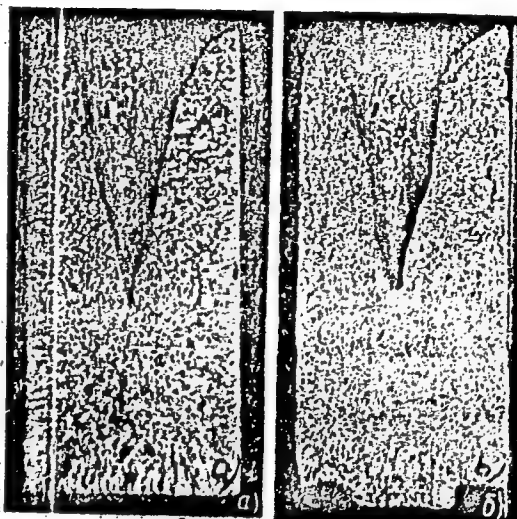
Figure 2

Figure 1



- 1 - funnel or channel;
- 2 - ladle; 3 - mold;
- 4 - vibrator

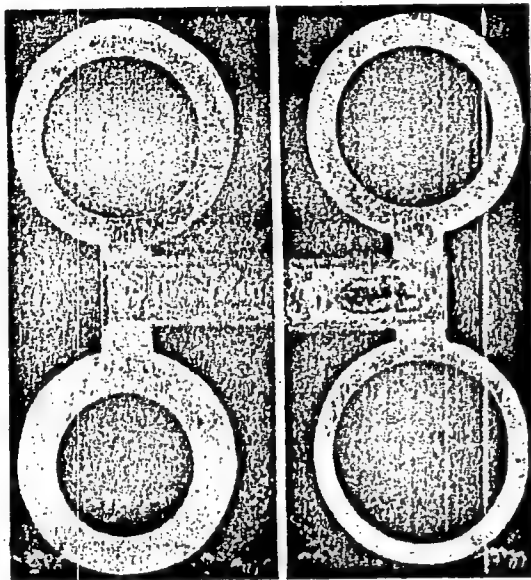
Card 5/7



Casting With a Vibration Pouring Device

S/128/60/000/007/004/017  
A105/A033

Figure 3



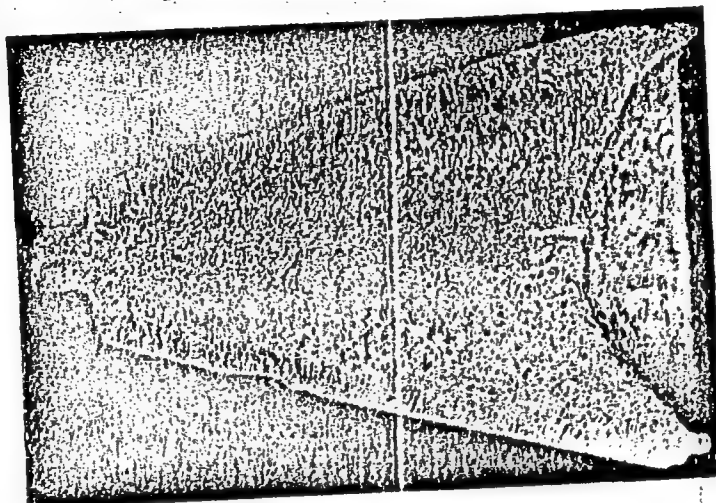
Card 6/7



Casting With a Vibration Pouring Device

S/128/60/000/007/004/017  
A105/A033

Figure 4



Card 7/7

S/136/61/000/001/006/010  
E021/E206

184000

AUTHORS: Balandin; G. F. and Yakovlev, Yu. P.  
TITLE: The Use of Vibration During the Continuous Casting  
of Non-ferrous Metals and Alloys  
PERIODICAL: Tsvetnyye metally, 1961, No. 1, pp. 75-78

TEXT: Experiments have been carried out on casting aluminium alloys using a vibrating pouring arrangement with the mould remaining still. The macrophotos (Fig. 1) show the effect of this treatment on alloys AMn, AV and Al cast at 720°C into a water cooled mould, 1a without any vibration and 1b with a vibrating funnel. The method was also tried for continuous casting. Fig. 2 shows the simple apparatus used, consisting of a mould and a vibrating channel down which the liquid metal flows. The frequency used was 14 000 c.p.s. and the amplitude 0.1 mm. Fig. 3 shows photographs of the fractures of zinc ingots (diameter 100 mm) made by continuous casting at 430°C (a - without vibration, b - with vibration). The vibration produced a much finer grain. Similar results were obtained with aluminium. The following mechanism of grain refinement is suggested. During casting, solid metal forms

Card 1/2

S/136/61/000/001/006/010  
E021/E206

The Use of Vibration During the Continuous Casting of Non-ferrous Metals and Alloys

on the walls of the pouring channel. Under the action of the vibrations and the liquid metal, this is removed and results in solid fragments being present in the liquid metal poured into the mould. These become the crystallisation nuclei. The theory was tested by using a pouring channel at 650°C for aluminium. At this temperature no solid metal formed and no refinement occurred. Figs. 4a and 4b show that no change in structure occurred at this temperature when vibrations were used. If aluminium wire was fed into the pouring channel, however, grain refinement occurred (Fig. 4c). This confirmed the theory that solid fragments of metal were causing nucleation. In the continuous casting of aluminium and magnesium alloys, it is therefore necessary to use a cooled pouring arrangement to obtain grain refinement by vibrations. There are 5 figures and 8 references; 7 Soviet and 1 non-Soviet.

Card 2/2

11500

27727  
9/128/61/000/008/004/004  
A054/A127

AUTHORS: Balandin, G. F., Gini, E. Ch., Sokolov, Ye. A., Stepanov, Yu. A.  
Yakovlev, Yu. P.

TITLE: Casting thin-walled, large-sized panel compounds in green sand-clay  
molds

PERIODICAL: Liteynoye proizvodstvo, no. 8, 1961, 38 - 39

TEXT: The casting of thin-walled, large-size panel parts of aluminum and magnesium alloys ensures a considerable saving in the weight of these components and in time. On the other hand some difficulties must be overcome, in the first place those encountered in filling the mold with the liquid metal. In the Soviet Union thin-walled panels are cast by successive crystallization or extrusion. The latter method is applied for AL4 (AL4) aluminum alloy sheets 800 x 1,500 x 2 - 5 mm in size, moreover for AL2 and ML5 (ML5) alloy panels. However, when applying the method for heat-resistant and high-strength AL8, AL19, B15 (V15) alloys, hot cracks are forming. In order to establish the cause of this defect tests were carried out at the Liteynaya Laboratoriya MVTU im. Bauman (Foundry Laboratory MVTU im. Bauman) and it was found that panel elements 500 x 800 x 3 - 4 mm

Card 1/4

X

27727  
S/128/61/000/008/004/004  
A054/A127

Casting thin-walled, large-sized ....

in size could be cast from AL19 and V15 alloys by applying the conventional casting and using green sand-clay molds. Test panels, 250 x 300 x 2 mm in size were cast using a channel (12 x 12 mm) around the panel which considerably facilitated the filling of the mold. The removal of air and gases from the mold cavities is also important in this process. When applying 0.3 - 0.4 mm thick inserts on the parting surface of the mold during the assembly, the filling of the mold improved, the ventilation through the narrow aperture at the parting surface of the mold became more intensive. The circumferential channel, the slot-type feeding system operating over the entire periphery of the casting, a high-capacity slag-chamber and a riser with a considerable cross section ensure a great intake of the liquid metal and an instantaneous filling of the mold. Moreover, ribs formed on the casting also promote a rapid filling of the narrow spaces. The gate and the ventilation system based on the above principles for casting 500 x 800 x 3 - 4 mm panels are shown. The molding mixture used consists of 55 - 60 % П01 (P01) type Tambovsk sand, 45 - 50 % quartz sand and chalk, having a humidity of 6 %, a gas permeability of 54 units and a compression strength of 0.24 - 0.27 kg/cm<sup>2</sup>. The binder contained 10 % Tambovsk sand and 90 % burnt sand and had a humidity of 4.5 % and a compression strength of 0.35 kg/cm<sup>2</sup>. It was found that the applica-

Card 2/4

27727

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A054/A127

Casting thin-walled, large-sized ....

tion of inserts at the parting surface of the mold had an adverse effect on the accuracy of the panel dimensions. Therefore, to promote ventilation, instead of using inserts, 1.0 - 1.5 mm wide grooves were cut in the parting surface along the periphery of the casting. This arrangement required a high casting temperature, (for the AL 4 alloys: 820 - 830°C, for the AL 19 and V15 alloys: 850 - 860°C). On the other hand the high temperature promoted the formation of cavities (in some cases the casting split into two parts). This could be eliminated by controlling the density of the mixture in the upper part of the mold by changing its composition and the intensity of ramming. In this way panels can be cast also from X18H9T (Kh18N9T) steel in dry sand molds. The mechanical properties of AL4, V15 and Kh18N9T steel panels meet the standards set. A deterioration of the mechanical characteristics could only be observed in AL 19 panels. This was caused by a lack of heat resistance in the metal. When coating the casting surface with hexachlorethane, however, the casting temperature of the AL19 alloy sheets could be reduced from 850 to 730°C. The dimensional accuracy of the castings depended on the assembling accuracy of the mold and on the stability of the bottom plate. During assembling the mold showed a deformation of 0.1 - 0.25 mm, while during transportation (shocks) the deformation of the thickness of the casting attained 0.4 - 0.5 mm (20 - 30 %). For this reason the application of dry sand core or

Card 3/4

Casting thin-walled, large-sized ....

27727  
S/128/61/000/008/004/004  
A054/A127

shell molds is indicated. There are 1 figure and 9 references: 7 Soviet-bloc, 2 non-Soviet-bloc. The references to English-language publications read as follows R. H. Osbrink, "Modern Castings", October 1958; N. C. Flemings et. al., Transactions A.F.S., " 1959.

Card 4/4

S/145/62/000/010/006/006  
D263/D308

**AUTHORS:** Balandin, G.F., Candidate of Technical Sciences,  
Docent, Gini, E.Ch., Aspirant, Sokolov, Ye.A., Engin-  
eer, Stepanov, Yu.A., Assistant and Yakovlev, Yu.P.  
Aspirant

**TITLE:** Filling capabilities of raw sand forms in casting  
of aluminum alloys

**PERIODICAL:** Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroy-  
eniye, no. 10, 1962, 184-191

**TEXT:** The article describes a series of experiments, with  
various types of pairing systems and different methods of filling  
sand forms for thin-walled (2 - 2.5 mm) panel type castings, conduct-  
ed in order to find the most practical solutions. Conclusions: impro-  
vements in filling capabilities can be obtained by using pouring sys-  
tems having minimal thermal and hydraulic losses. Quick pouring im-  
proves filling capability but requires good ventilation. To obtain  
required accuracy and thickness of castings, rigging of increased

Card 1/2



Filling capabilities ...

S/145/62/000/010/006/006  
D263/D308

rigidity is necessary. High overheating (160 - 180°C above liquidus) makes it possible to obtain castings of 500 - 800 mm size with wall thickness of 1.5 mm. Filling capabilities can also be improved considerably by treating form surfaces with special coverings (chalk, amorphous carbon); this lowers the pouring temperature and consequently castings can be made using alloys whose properties are reduced at high overheatings. There are 4 figures and 2 tables.

ASSOCIATION: MVTU im. N.I. Bauman

SUBMITTED: December 8, 1961

Card 2/2

S/126/62/013/003/015/023  
E193/E383

1.1500

AUTHORS: Balandin, G.F. and Yakovlev, Yu.P.

TITLE: On the problem of the effect of vibration on solidification of alloys in castings

PERIODICAL: Fizika metallov i metallovedeniye, v. 13, no. 3, 1962, 436 - 440

TEXT: It has already been established that the effectiveness of vibration as a means of grain-refining of the structure of castings varies from alloy to alloy. It has been possible in the case of some materials to determine the optimum conditions of this treatment; in the case of other (pure zinc and the 18-8 stainless steel, in particular) materials, the treatment seems to be ineffective irrespective of the frequency, amplitude and intensity of vibrations employed. The present author analyzed the relevant experimental evidence and came to the conclusion that the most likely explanation of the different response of various metals to vibration is best explained in terms of the theory according to which the grain-refinement brought about by the application of vibration to a molten alloy

Card 1/3

S/126/62/013/003/015/023  
E193/E383

On the problem of ....

during casting is due to the fact that this treatment increases the number of crystal fragments broken away from the solidifying skin, providing additional crystallization nuclei. If this theory is correct, then, all other conditions being equal, the beneficial effect of the vibration should be closely related to the strength of the crystals of a given alloy near its solidus. Using his own experimental results and data obtained by M.N. Bochay (Mechanical properties of aluminium alloys during solidification in relation to the formation of hot-welding cracks (Mekhanicheskiy svoystva alyuminiyevykh splavov v protsesse kristallizatsii i ikh svyaz') - Dissertation, Moscow, 1958), the present authors constructed a graph, reproduced in Fig. 3, where the UTS ( $\sigma$ , kg/mm) of Al-Si alloys near the solidus temperature, the thickness (H, mm) of the columnar-crystals zone and the average grain size (d, mm) in ingots cast from a vibrated tundish are plotted against the silicon content (%) of the alloy. It will be seen that the concentration dependence of these three properties follows the same course. Since

Card 2/4

5  
On the problem of ....

S/126/62/013/003/015/023  
E193/E383

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graphs constructed for Al-Cu alloys and steels showed a similar relationship, it was concluded that the extent of the columnar-crystal zone and the average grain size in metal castings were in fact related to the strength at temperatures near the solidus and that this relationship determined the effectiveness of vibration treatment as a means of grain-refining of cast structures. There are 4 figures.

ASSOCIATION: Moskovskoye vyssheye tekhnicheskoye uchilishche  
im. Baumana (Moscow School of Higher Technical  
Education im. Bauman)

20  
SUBMITTED: June 24, 1961

25  
Card 3/4  
30